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Diplotomma, *Lecanora*, and *Xanthoria* lichen species new to Turkey

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Abstract — During a recent excursion in Kemaliye district of Erzincan region (Turkey), we sampled lichens from 6 localities, among which *Diplotomma hedinii, Lecanora valesiaca,* and *Xanthoria weberi* were determined as new to Turkey and the Middle East and *X. weberi* also new to Asia. Geographic distribution, substrate, chemistry, and comparisons with morphologically similar taxa are presented.

Key words — *Ascomycota*, biodiversity

Introduction

The lichen flora of Turkey, as in many parts of the world, is still incomplete. Although many recent studies (Candan & Turk 2008, Candan & Halici 2009, Halici & Güvenc 2008, Halici & Aksoy 2009, Yazici & Aslan 2009, Yazici et al. 2008, 2010a,b) contributed to the lichen flora of Turkey, unexplored regions of the country are still larger than the explored ones. Therefore, more studies are needed to form a complete lichen flora of Turkey.

Although part of Erzincan flora has been previously described (Yazici & Aslan 2003), no studies were carried out around Kemaliye district.

Material & methods

Some lichen species were collected from 6 localities in June and July 2009. Air-dried samples were examined with Nikon SMZ1500 stereomicroscope and a Nikon Eclipse 80i light microscope. Identifications were determined by consulting using books (Poelt 1974, Smith et al. 2009) and papers (Upreti & Chatterjee 1998, Aptroot et al. 2009, Lindblom 2006).

The Kemaliye district has many deep valleys, high mountains, and plateaus. Continental climate dominates the higher altitudes while a mediterranean-type

microclimate is present on the valley floors. The district's largest valley is Karasu Valley, and other valleys have been carved by branches of the Karasu River, which reaches Keban Dam Lake just beyond the district border. The presence of Keban Lake dramatically alters climatic conditions at the valley bottoms, where summer temperatures and humidity significantly increase compared to near regions (Bulut 2006). Dominant plant cover in the district is mountain steppe. Frequent patches of squat trees like *Quercus* sp. and *Juniperus* sp., as well as *Rosa canina* shrubs can be seen over on the hills. The valleys are mostly covered by fruit trees of anthropogenic origin.

The collection site is a well-lit, windswept, open area with gently sloped terrain with grass and rocks. The stream is mostly surrounded by fruit trees. *Quercus, Populus* and *Rosa* trees are dominant in the vicinity, with *Salix* and *Carpinus* occasionally present. The climate is characterized by cold, snowy winters and hot, dry summers. Mean annual temperature is16. 6°C. The mean annual rainfall is about 380.6 mm, with a precipitation range of 206–633 mm. Mean annual humidity is 62% (Akman 1999).

Vouchers are stored in the herbarium of the Biology Department, Kazım Karabekir Education Faculty, Ataturk University, Erzurum, Turkey (ATAKKEF).

Species

Diplotomma hedinii (H. Magn.) P. Clerc & Cl. Roux, (as *"hedinianum"*) Cryptogamica Helvetica 19: 292. 2004.

Specimen examined: **TURKEY. Erzincan:** Kemaliye, Avaz place, Avukatın çeşmesi (Lawyer's spring), 38°28'28"N, 39°13'02"E, on calcareous rock, 1375 m, 15.06.2009, ATAKKEF–450.

Thallus white or pale to dark grey, thin or thick, often wide-spreading, smooth or rimose-cracked or sometimes granular, ± determinate; prothallus absent. Apothecia 0.3–0.8(–1.5) mm diam.; disc flat at first, soon ± convex, often pruinose; thalline exciple sometimes present, white, sometimes ± crenulate; true exciple inconspicuous; epithecium brown; hymenium 45–75 µm tall, colourless. Asci 55(–65) × (10–)17(–24) µm. Ascospores 15–20 × 7–11µm, (1–)3-septate, not longitudinal septa, frequently curved and mostly submuriform at maturity. Thallus C–, K–, KC–, Pd–, UV–.

Diplotomma hedinii is mainly a temperate species of exposed calcareous rocks and sandstone outcrops in more or less sunny conditions. Previously known from Africa, Asia, Europe, and Central and North America; new to Turkey and the Middle East.

Remarks—*Diplotomma hedinii* is similar to *D. alboatrum,* but *D. alboatrum* has 15–24 × 8–10 µm ascospores with longitudinal septa and which are less frequently curved.

Lecanora valesiaca (Müll. Arg.) Stizenb., Ber. Thätigk. St. Gallischen Naturwiss. Ges. 81: 342.1882

Specimens examined: **TURKEY. Erzincan:** Kemaliye, Mezbanbaşı place, 6.5 km SW of Sırakonak, 38°25'54"N, 39°11'15"E, on siliceous rock, 1851 m, 10.06.2009,

ATAKKEF–453; 900 m SW of Kekikpınarı, 38°27'30"N, 39°08'37"E, on siliceous rock, 1275 m, 10.06.2009, ATAKKEF–456; Geşo Boğazı place, 1700 m NE of Yeşilyamaç, 38°34'00"N, 39°16'15"E, on siliceous rock, 1682 m, 11.06.2009, ATAKKEF–455; Avaz place, Avukatın Çeşmesi (Lawyer's Spring), 38°28'28"N, 39°13'02"E, on siliceous rock, 1375 m, 15.06.2009, ATAKKEF–452; vicinity of Çitköy, 38°36'22"N, 39°06'45"E, on siliceous rock, 1030 m, 12.07.2009, ATAKKEF–454.

Thallus up to 3.0 cm diameter, ± white, rosettes, pruinose, flat, frequently slightly undulate margins, yellow-greenish under the pruina, centrally areolate; thallus lobes rounded, older lobes not hollow; marginal lobes, 0.5–1.1 mm wide, (0.9–)1.0–2.0(–2.1) mm long, flattened, bifurcate and verrucose; upper surface, pruinose., Apothecia sessile to adnate, in the centre of the thallus 0.3–1.0(–1.3) mm diam., discs, yellow-brown light brown, pruinose, convex at maturity; margins thick, entire, covering the discs at first, thin, curved at maturity; epithecium brown; hypothecium pale yellow; paraphyses mainly cylindrical, unbranched, apices swollen; asci cylindrical-clavate, 8-spored, (25–)32–40(–42) × (11–)12–14(–15) µm; ascospores oval-ellipsoid, (8–)9–12 × 4–6(–7) µm. Thallus and medulla K–, C–, KC+ yellow, PD-.

Lecanora valesiaca grows on sloping faces of lime-poor, hard, base-rich rocks containing some calcium in warm-dry situations, and above all on south-facing exposed sites in the interior alpine dry valleys. Previously known from Asia, Europe, and North America; new to Turkey and the Middle East.

Remarks—*Lecanora valesiaca* is very similar to *L. freyi,* but *L. valesiaca* has thin lobes, a thicker margin, and verrucose lobe ends while *L. freyi* has thick lobes, a thin margin, and smooth lobe ends. Although both species possess similarly sized apothecia and ascospores, apothecia with incurved margins and yellow brown discs will separate *L. valesiaca* from *L. freyi*, characterized by apothecia with entire margins and flat, blackish green discs. The incurved apothecial margins, verrucose lobe ends, and pruinose thallus also distinguish *L. valesiaca* from *Protoparmeliopsis muralis* var. *muralis.*

Xanthoria weberi (S.Y. Kondr. & Kärnefelt) Aptroot, Herzogia 22: 151 (2009)

Specimen examined: **TURKEY**. **Erzincan:** Kemaliye, 1200 m, SE of Dutluca, 38°37'25"N, 39°07'42"E, on calcareous rock, 1165 m, ATAKKEF–451.

Thallus foliose, up to 4(–5) mm wide, forming small thalli, adnate to loosely adnate. Lobes horizontal to somewhat ascending, dorsiventral, flat, 0.3–0.5 mm wide, lobe tips often incurved, outermost parts of mature lobes ± truncate. Upper surface yellow to orange, smooth. Lower surface white. Cortex layers paraplechtenchymatous. Photobiont trebouxioid, green, unicellular. Medulla reticulate, of short cells. Rhizines mostly present (abundantly in a few specimens seen), white, yellow when exposed, attached or free. Soralia in lobe tips, often forming small bird nest soralia, soredia yellow. Apothecia rare, 0.7–2.0 mm wide. Ascospores 12.5–14 × 7–7.5 µm, septum 2.8–4.5 µm thick. Pycnidia

laminal, common, orange. Conidia bacilliform, 3.3–3.5 µm long. Cortex and apothecia K+ purple, C–, PD–, I–; medulla K–, C–, PD–, I–.

X. weberi grows in dry habitats on a variety of substrates, both bark and rock as well as on man-made substrates such as concrete and tombstone. Previously known from Europe and North America; new to Turkey and Asia.

Remarks—*Xanthoria weberi* resembles *X. gallowayi, X. oregana,* and *X. fulva*. *Xanthoria weberi* has shorter and slightly wider lobes with more incurved lobe tips than *X. gallowayi*, and where *X. weberi* sometimes has apothecia and frequently conspicuous pycnidia, no apothecia and pycnidia have been noted for *X. gallowayi* (Kondratyuk & Kärnefelt 1997). *Xanthoria weberi* has longer lobes and a brighter yellow pigmented upper surface than *X. fulva,* from which it is also distinguished by its dichotomously branched lobes, with more distinctly truncate lobe tips and relatively long internodes. The small bird nest-like soralia that occur mostly in the lobe tips and narrower, more regular dichotomously branched lobes in *X. weberi* help to differentiate it from *X. oregana.*

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